

IN THE ABSTRACT:

Please substitute the following abstract for the abstract in the application:

~~A structure and method for forming a magnetic field sensor device comprises depositing a first electrode onto a substrate. Then, an electrically insulating layer is deposited on the first electrode. Next, a portion of the insulating layer is removed to expose a region of the first electrode, thereby creating an empty space. After this, at least one layer of chemically-synthesized nanoparticles is deposited on the insulating layer and within the empty space. Next, a second electrode is deposited on both the layer of nanoparticles and the insulating layer. Alternatively, multiple layers of nanoparticles may be deposited, or only a single nanoparticle may be deposited. The substrate is either conducting or non-conducting, and the first and second electrodes are electrically conducting and may be magnetic or non-magnetic. Additionally, a metallic layer of magnetic material may be first deposited on the substrate.~~

A magnetic-field sensor device comprises at least two electrodes; an insulating layer separating the at least two electrodes; at least one layer of chemically-synthesized magnetic nanoparticles disposed at or above a level with the insulating layer, and disposed between the at least two electrodes; and an organic spacer surrounding each of the chemically-synthesized magnetic nanoparticles. A deviation between diameters of different ones of the nanoparticles is less than 15%. Moreover, the chemically-synthesized magnetic nanoparticles range in size between 2 nm and 20 nm in diameter.